

MEASUREMENTS OF HNO_4 : IMPLICATIONS FOR HO_x

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Establishing a quantitative understanding of the abundance of peroxyntic acid (HNO_4) is of interest because its reaction with OH is believed to be a significant sink for HO_x in the lower stratosphere and upper troposphere. Provided the photochemistry of HNO_4 is well understood, space-borne measurements of HNO_4 can be used to diagnose the combined abundance of the hydrogen and nitrogen radical species HO_2 and NO_2 . We examine concentration profiles of HNO_4 obtained by the MkIV Fourier transform infrared spectrometer for two flights, one at mid-latitudes, the other at 66°N during spring. Although the mid-latitude observations of HNO_4 agree fairly well with a calculated profile based on standard kinetic parameters, the high-latitude spring time measurements of HNO_4 are about a factor of two less than calculated. Introduction of a speculative long-wave ($> 650 \text{ nm}$) photolytic pathway for HNO_4 is shown to lead to good agreement between theory and observation of HNO_4 for both the mid-latitude and high-latitude regions. We discuss why this occurs and implications of the HNO_4 sink for HO_x .